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What is morphine? What is it used for?

**Morphine** is a potent opiate analgesic psychoactive drug and is considered to be the prototypical opioid. Morphine is the most abundant alkaloid found in opium, the dried sap (latex) derived from shallowly slicing the unripe seedpods of the opium, or common or edible, poppy, *Papaver somniferum*. Morphine was the first active principle purified from a plant source and is one of at least 50 alkaloids of several different types present in opium, Poppy Straw Concentrate, and other poppy derivatives. Morphine is generally 8 to 17 per cent of the dry weight of opium, although specially-designed cultivars reach 26 per cent or produce little morphine at al, under 1 per cent, perhaps down to 0.04 per cent. In clinical medicine, morphine is regarded as the gold standard, or benchmark, of analgesics used to relieve severe or agonizing pain and suffering.

Morphine can be used as an analgesic to relieve:

* pain in myocardial infarction
* pain in sickle cell crisis
* pain associated with surgical conditions, pre- and postoperatively
* pain associated with trauma
* severe chronic pain, e.g., cancer
* pain from [kidney stones](http://en.wikipedia.org/wiki/Kidney_stones) (renal colic, ureterolithiasis)
* severe [back pain](http://en.wikipedia.org/wiki/Back_pain)

Morphine can also be used:

* as an [adjunct](http://en.wikipedia.org/wiki/Adjunct) to [general anesthesia](http://en.wikipedia.org/wiki/General_anesthesia)
* in [epidural anesthesia](http://en.wikipedia.org/wiki/Epidural_anesthesia) or intrathecal analgesia
* for [palliative care](http://en.wikipedia.org/wiki/Palliative_care) (i.e., to alleviate pain without curing the underlying reason for it, usually because the latter is found impossible)
* as an [antitussive](http://en.wikipedia.org/wiki/Antitussive) for severe cough
* in nebulized form, for treatment of [dyspnea](http://en.wikipedia.org/wiki/Dyspnea), although the evidence for efficacy is slim.[[14]](http://en.wikipedia.org/wiki/Morphine#cite_note-13) Evidence is better for other routes.[[15]](http://en.wikipedia.org/wiki/Morphine#cite_note-14)
* as an [antidiarrheal](http://en.wikipedia.org/wiki/Antidiarrheal) in chronic conditions (e.g., for diarrhea associated with [AIDS](http://en.wikipedia.org/wiki/AIDS), although[loperamide](http://en.wikipedia.org/wiki/Loperamide) (a non-absorbed opioid acting only on the gut) is the most commonly used opioid for diarrhea).
* for remarkable relief of acute [pulmonary edema](http://en.wikipedia.org/wiki/Pulmonary_edema) through an unknown mechanism
* To lower and stabilise blood glucose in diabetics and combat other diabetic effects including [diabetic neuropathy](http://en.wikipedia.org/wiki/Diabetic_neuropathy) -- morphine and whole opium preparations were used for this purpose well into the 1960s in North America and Europe and in much curtailed fashion now and in other countries. Morphine will also impact hypertension, levels of lipids like cholesterol in blood, and improve laboratory indices in certain types of anaemia, although whole opium preparations are preferred for these purposes if allowed. Most often, chronic pain patients with one or more of the four above conditions are treated with morphine rather than synthetics like [pethidine](http://en.wikipedia.org/wiki/Pethidine).
* Experimentally for refractory depression. Morphine, hydromorphone, opium products and the like were used *on-label* for depression from antiquity or prehistoric time up into the middle 1950s.

What is heroin? What do you know about it?

**Heroin**, or **diacetylmorphine** ([INN](http://en.wikipedia.org/wiki/International_Nonproprietary_Name)), also known as **diamorphine** ([BAN](http://en.wikipedia.org/wiki/British_Approved_Name)), is a [semi-synthetic opioid](http://en.wikipedia.org/wiki/Opioid) [drug](http://en.wikipedia.org/wiki/Drug)synthesized from [morphine](http://en.wikipedia.org/wiki/Morphine), a derivative of the [opium poppy](http://en.wikipedia.org/wiki/Opium_poppy). It is the 3,6-[diacetyl](http://en.wikipedia.org/wiki/Acetate) [ester](http://en.wikipedia.org/wiki/Ester) of morphine ([*di*](http://en.wikipedia.org/wiki/Numerical_prefix#Table_of_non-technical_numeric_prefixes)(two)-[*acetyl*](http://en.wikipedia.org/wiki/Acetylation)*-*[*morphine*](http://en.wikipedia.org/wiki/Morphine)). The white [crystalline form](http://en.wikipedia.org/wiki/Crystalline_form) is commonly the [hydrochloride salt](http://en.wikipedia.org/wiki/Hydrochloride_salt) **diacetylmorphine hydrochloride**, though often adulterated thus dulling the sheen and consistency from that to a matte white powder, which heroin [freebase](http://en.wikipedia.org/wiki/Free_base_%28chemistry%29) typically is. We only know that excess use of heroin can lead to addicion.

Questions:

What do they have in common?

Morphine and Heroin have the same central atom. They are both used as analgesic. They come from opium poppy.

What functional groups?

            Morphine – alkene, alcohol, ether, amine, phenol

Heroin - amine

Use the following references:

Morphine, see <http://en.wikipedia.org/wiki/Morphine>

Heroin, see <http://en.wikipedia.org/wiki/Heroin>